The Furniture Foothills and the Spatial Fix: Globalization in the Furniture Industry

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Abstract:

Spatial shifts in the location of manufacturing continue, but understanding why particular regions prove attractive to particular industries and elements within those industries lags. A sharp increase in fuel cost prompted considerations of a major geographic shift shortening the distance between producers and markets in the furniture industry. This research focuses on the role of logistics based manufacturing location decisions in furniture's global value chain. A succession of sites through the product life cycle is proposed along with segmentation of different types of furniture that prioritize different locations based on the relevant competitive advantage. New pricing considerations since the late-2008 economic downturn indicate spatial fix strategies continue, with shifts in the location of global value chain components.

Keywords: furniture | global value chain | spatial fix

Article:

Introduction

Global competition at the end of the 20th century devastated the furniture industry in the Piedmont region extending from Virginia's south central counties bordering North Carolina through a central swath of the Tarheel state, weakening a major segment of the region's traditional economic base along with tobacco and textiles. The soaring price of fuel in 2005, accelerating in early 2008, impacted the cost of transportation sufficiently for some major manufacturers to increase or consider increasing U.S.-based production capacity in heavy, bulky goods: machinery components, steel, heavy equipment suppliers, building material and furniture (Engardio et al. 2008). Since then fuel costs decreased sharply but are again slowly rising, with analysts posing the possibility that peak oil attainment foreshadows an inexorable increase in the cost of fuel (Li 2008).

This case study of the North Carolina-based furniture industry is situated within the theoretical frameworks of global-value chains and production networks (Sturgeon 2008; Gereffi et al. 2006; Coe et al. 2004), clusters and the spatial fix (Harvey 1982). It tests the hypothesis that a variety of factors, including logistics (shipping costs, delivery time), market niche and agency in the form of individual actors exercising leadership, are crucial parts of the geographic location decision. Labor cost differentials at various locations, while certainly important, are only one of many considerations for corporate relocation. The major challenge for companies remaining in their traditional U.S. location, in an industry afflicted by outsourcing, lies in the search for a non-labor cost-based comparative advantage. This study asserts that several avenues and some evidence remain for regional sustainability on the basis of innovative organizational practices, taking the high road of best-practices implementation rather than the low road of wage reduction (Tewari 2005).

Terminology needs to be sorted out early for clarity. The "production chain" or "global production network" (Coe et al. 2004) refers to all aspects involved in the manufacture of a product. The "supply chain" refers to aspects of gathering the parts needed for the manufacture, particularly focused on logistics considerations. "Global value chain" literature extends the production chain concept to consider at what stages—and locations—value is added in the process and which locations are particularly suited to what step (Coe et al. 2004; Sturgeon et al. 2008). The furniture industry case study examines the complex arrangements involved in the logistics of managing a supply chain. Major considerations causing variations include the political context of policies at the national, state and local scales, decisions of individuals (business executives and employees, potential and actual), and the local culture of social economic relationships (Glassman 2007).

The key to an industry's logistics success lies in its ability to respond quickly and creatively to changes affecting the supply chain in order to make nimble sourcing decisions (SCDE 2008). Data from the U.S. Department of Commerce quarterly reports, updated in mid-June 2008 and 2009, combined with interviews of industry experts, provide a picture of employment and production capacity response in sectors such as furniture that are highly sensitive to fluctuations in fuel cost and the economic downturn that depressed housing and consumer spending. The push of starkly higher fuel prices leads manufacturers to the shove of seeking multiple ways to relieve price pressure, from leaner manufacturing processes to just-in-time relocating of warehouses and production hubs, and reconsidering continents sourced.

Spatial Fix explanations for the practice of companies shifting production sites involve calculations of new place-based cost advantages (Harvey 1982;Schoenberger 2004). Recent changes in the North Carolina furniture industry suggest indications of an incipient U-turn (Harrison and Bluestone 1988) linked to logistics price increases reprioritizing locations in the global production process. An underlying theoretical issue is whether economic globalization—the extension of production networks worldwide in order to profit from factor cost differentials—might be better conceived of as regional clusters of advantage (Tavasszy et al.

2003). From assembling initial inputs to retail store delivery, the power of proximity underlies what some observers foresee as a new regionalization of shortening supplier lines, a long-brewing "revenge of localization" (Mortished 2008, p 23).

The globalization debate includes questions of whether product-cycle considerations affecting migration of industrial sites in the developed world (e.g., textiles from England to the U.S. Northeast and then Southern states) apply to outsourcing in Asia, as seen in the furniture industry at the turn of the 21st century (Yeung and Lin 2003). The generally under-examined nature of the logistics and distribution links enabling—or constraining—global networks in a far-flung production chain call for a careful consideration of their application to the bulky, heavy furniture example wherein time, production efficiency, multi-modality and quality handling practices are critical considerations (Dicken 2007).

Both the furniture and the logistics industry remain highly concentrated geographically, reflecting specialization in type of goods carried (furniture needs careful handling) and trust built up from long-term relationships (Aoyama and Ratick 2007). Despite continued plant closings in major furniture-cluster states, announcements of expansion by some companies raised questions as to whether foreign-owned manufacturers such as IKEA were bringing their higher technology operations to the U.S. in a move similar to the Japanese revival of steel in the Rust Belt (Allegrezza 2008).

Beyond the low-cost particle board material and highly mechanized manufacturing involved in the IKEA process, the movement of Stickley furniture's upholstery work to North Carolina provides a high-skill, high-cost model relevant to remaining manufacturers. In Stickley's case, goods production remains concentrated in upstate New York, since a large showroom opened in High Point in 2000 to capture interest generated by the semi-annual Furniture Market and the local market. In the mid-1990s Stickley acquired a small upholstery company in High Point to diversify its line. Due to the need for rapid response customization in high-end products, upholstery tends to remain in the U.S. In late 2008, Stickley added a mid-range casual dining division purchased from a declining Massachusetts company (founded in the 1700s) that it plans to transform by applying a form of innovation: lean manufacturing (LM). Pioneered by Toyota and first adapted to furniture production by Hickory Chair, LM integrates process techniques such as team work with computerized machinery to re-invigorate production (Figure 1). Stickley also followed industry practice by diversifying its geography to fit product price level, with a less expensive, highly carved "Antiquities" line made in Vietnam.

Clusters of companies related to a particular industry occur in advantageous sites suitable for their function in the value chain. Previous studies of global furniture production clusters indicate varied results for localized information exchange: positive for Denmark (Maskell 1998), negative for the Philippines (Beerepoot 2008). This case study of the furniture industry includes participant observation evidence that particular leaders can be critical to the identification, implementation, and spread of innovations.

Figure 1. Hickory Chair Lean Manufacturing Cell Team.

A major distinction exists between three categories of furniture quality: the lowest end which prioritizes mechanization and economies of scale, a middle grade which prioritizes labor-cost reduction, and at the high end a reliance on efficiency and economies of scope (Scott 2006). The different location implications of these three categories are discussed in detail. As an extension to product-cycle theory, it is argued that although regional advantages range from low-tech, low-cost advantages to high-end customization, the scale shift can occur within the same region with the introduction of technology, education, process and logistics improvements. Distance is neither determinate nor insignificant as a factor in production location decisions.

The first section of this examination provides a background of the U.S. furniture industry geographic concentrations, followed by a discussion of the industry's flight overseas and ensuing logistics supply-chain arrangements. The third section examines how these two trends intersect in North Carolina and Virginia. The conclusion reviews future scenarios with implications for globalization adjustments.

Spatial Evolution of the Furniture Industry

Definitions of the modern furniture industry based on NAIC code components (Table 1) indicate the broad extent of its products, from wood to metal, home (52 percent) to office, institutional (15 percent) and outdoors (IBIS 2008). Although the American Home Furnishings Association uses a wide range of NAIC code to capture a broad range of categories that could be involved in furniture production in some way, the industry analysis group IBIS focuses on a more narrow

core segment. This research uses IBIS' 5-digit NAIC code classification for furniture unless otherwise specified.

Table 1. NAIC Codes for Furniture Industry: AHFA

314999	All Other Miscellaneous Textile Product Mills
321912	Cut Stock, Re-sawing Lumber, and Planing
321999	All Other Miscellaneous Wood Product Manufacturing
327390	Other Concrete Product Manufacturing
327991	Cut Stone and Stone Product Manufacturing
332510	Hardware Manufacturing
337121*	**Upholstered Household Furniture Manufacturing**
337122*	**Non-upholstered Wood Household Furniture Manufacturing**
337124*	**Metal Household Furniture Manufacturing**
337125*	**Household Furniture (except Wood and Metal) Manufacturing**
337127*	**Institutional Furniture Manufacturing**
337211	Wood Office Furniture Manufacturing
337212	Custom Architectural Woodwork and Millwork Manufacturing
337215	Showcase, Partition, Shelving, and Locker Manufacturing
339113	Surgical Appliance and Supplies Manufacturing
423450	Medical, Dental, Hospital Equipment and Supplies Wholesalers

* Components of IBIS Household Furniture Manufacturing Industry sector

As the early center of American industrialization and woodworking craftsmanship, Boston boasted 28 furniture plants by 1875. Fifteen years later Cincinnati became the center, with 130 furniture companies employing more than 3,000 workers (Cater 2005). By 1910 it was the turn of Grand Rapids, Michigan, with 7,250 employees in 54 furniture businesses. New York City and Chicago hosted the first furniture expositions and the largest concentrations of furniture-making by the turn of the 19th century. Raw material depletion and economic depression soon doomed the North for wooden furniture manufacture. In an interesting echo of a regional shift that re-occurred a century later, Northern entrepreneurs subsequently moved to the South to found a new furniture industry. North Carolina's competitive advantage lay with an abundance of lumber, low-cost labor combined with Reconstruction era woodworking skills and attitudes, and infrastructure providing good proximity to centers of the domestic furniture market (Lemert 1934; Thomas 1964).

At the dawn of the Southern Industrial Revolution, the central Piedmont location enabled easy access to lumber and a distribution network via the Southern Railway and the port of Norfolk, Virginia. The entrepreneurship of Thomas Wren, whose family owned the High Point Furniture Company from 1888 to 1942, built a skill base and attracted others into the Piedmont-area furniture business. Introduction of mass manufacturing techniques by Bassett in 1902 modernized the industry for the low- and mid-level market, primarily utilizing abundant local oak and hickory trees for bedroom, dining room and kitchen furnishings. Early process innovators laying the groundwork for North Carolina's furniture industry included White (of

White Furniture) and Tomlinson, who encouraged establishment of a cluster of furniture related industries and consolidated logistics and distribution operations (Bamberger and Davidson 1998;Tewari 2005).

High Point, North Carolina, hosted its first furniture market in 1905 to advertise its furniture industry location advantages. Expansion of the furniture market to a permanent facility in 1921 heralded High Point's dominant position that would last until early in the next century (Carolina Publications 2008). North Carolina rose to prominence in the U.S. furniture industry during the years of the Great Depression, forced to upscale its production due to the collapse of the low-cost Southern market and the desire to avoid competing with high-end Northern producers who still supplied the hardware and machinery. Under the leadership of local furniture manufacturers and city leaders, the Piedmont region assembled an integrated cluster of other related suppliers, from glue and veneer to upholstery, textiles, furniture finishing, bedding and cardboard boxing. By 1939 North Carolina was the leading site of global wooden furniture production, completing the Piedmont Triad's "three-legged stool" economic base along with textiles and tobacco (Lemert 1934).

Declaring itself the "Furniture Capital of the World," North Carolina employed 90,000 workers producing 50 percent of all U.S.-made furniture in the 1980s (Lacy 2004). More than $6 billion in annual furniture and furnishing sales flowed from over 600 manufacturers (Table 2), largely located in a "figure eight" pattern within 50 miles of Statesville, North Carolina (Figure 2). The Piedmont cluster included High Point, with a southwestern cluster in the vicinity of Hickory. The 1984 merger of the major furniture industry organizations into the American Home Furnishings Alliance (AHFA) headquartered in High Point solidified the region's preeminence—which, as was the case for its predecessor regions, was not to last long (Cater 2005; UNC Press 2008).

Table 2. 2004 NC Furniture Company Employment Cities

City	Employees
High Point	13,600
Lenoir	8,900
Thomasville	6,500
Asheboro	6,064
Hickory	4,525
Lexington	3,000
Morganton	1,700
Maiden	1,500
Hudson	1,250
Lincolnton	600
TOTAL	47,639

At its peak in the 1980s, two changes within the industry led to major negative consequences. Largely dominated by family-owned enterprises, many companies opted to sell ownership to corporations which were then absorbed by conglomerates. Purchases by Missouri-based Furniture Brands International (FBN) illustrate the trend, as the conglomerate absorbed Drexel Heritage, Henredon, Maitland-Smith, Broyhill, Lane, and Thomasville Furniture from 1996 to 2001 (Drayse 2008). Managers unfamiliar with the furniture business went to Europe and purchased cutting edge automated machines, but skipped front and back end process components, leaving their firms un-competitive. Although the cost of labor in a typical Swedish plant such as IKEA is the same as in a U.S. furniture plant, the average Swedish plant producing goods annually worth $100 million is half the size of a U.S. factory, takes three days to finish, and employs 225 people, 150 of whom work in the data center with a highly automated process. The average U.S. furniture factory takes six weeks for the same output, and employs 775 people; China's model takes 2,500 people, more time, less cost. To emphasize a point made earlier concerning regional competitive factors, the cost and time differentials were compounded by poor management decisions on the part of U.S. companies, rather than resting solely on workers' wages which are less subject to change.

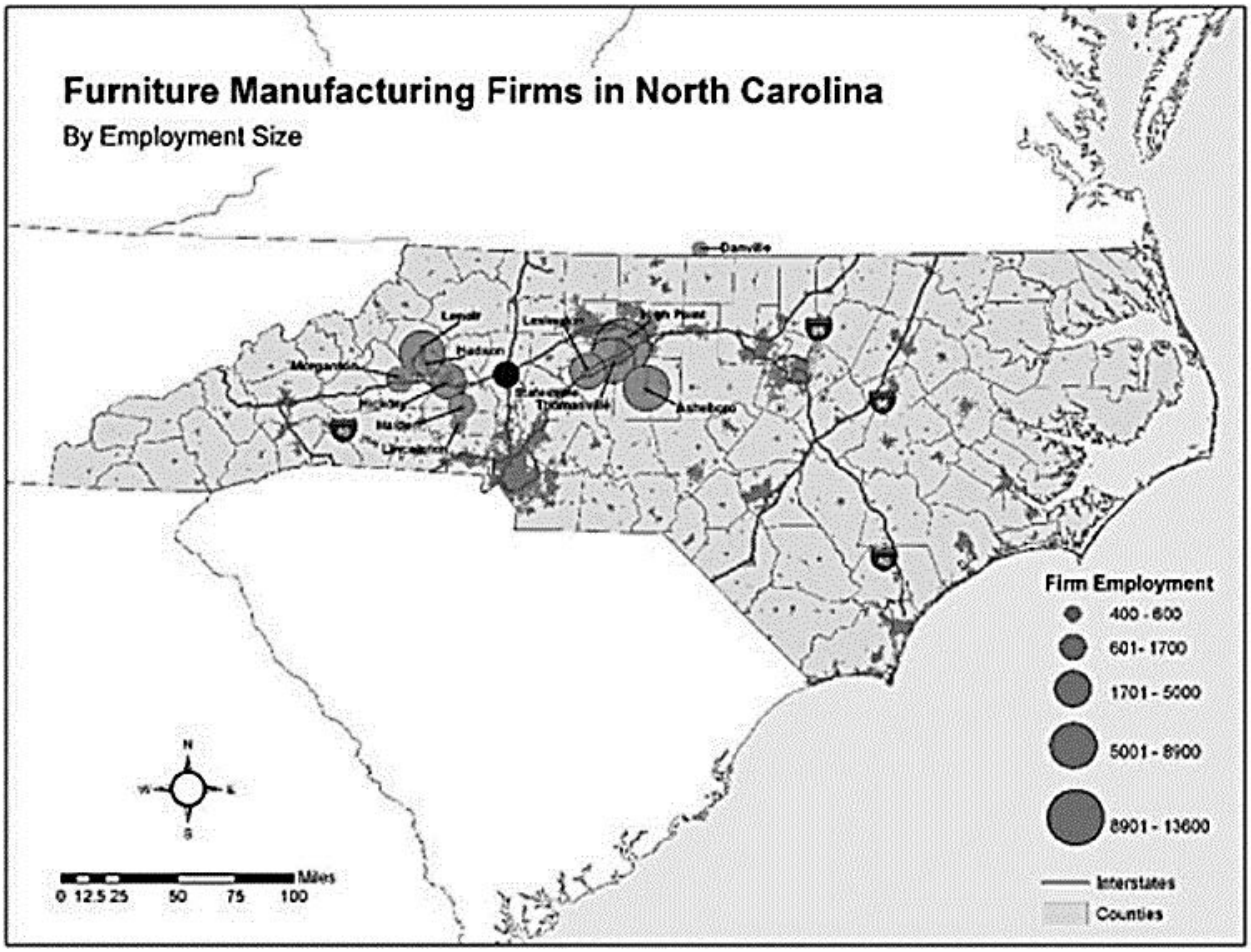
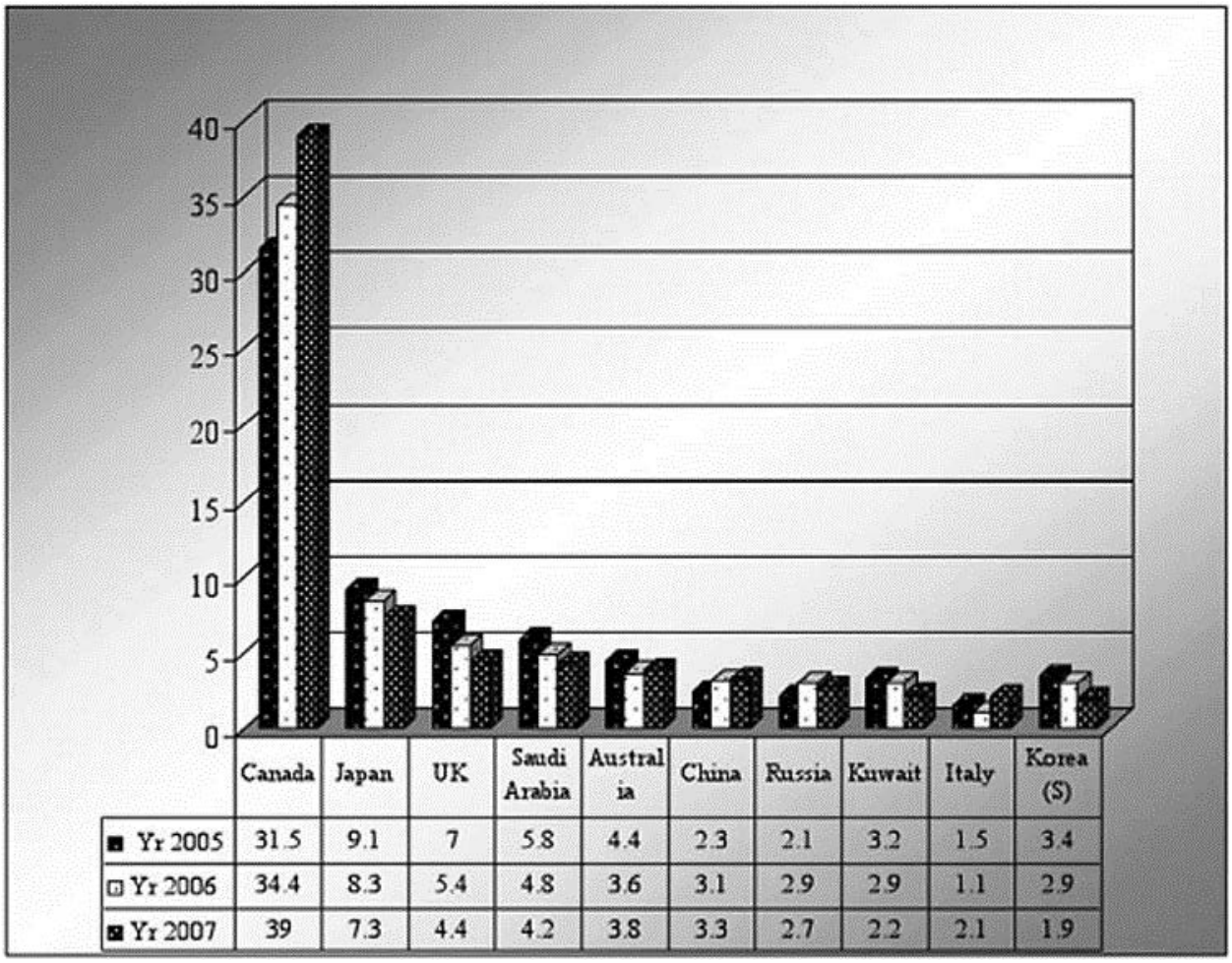


Figure 2. Furniture Manufacturing Employment.

Expansion of globalization opened opportunities for foreign competition. Outsourcing stages of production to China and Latin America, in particular, posed severe challenges to North Carolina furniture manufacturers. Forty-seven furniture companies folded during the 1990s, and North Carolina furniture jobs dropped by 20,000 from 1996 to 2006 (Holmes 2008). The Canadian industry suffered a greater collapse than that of the U.S., becoming a major furniture importer from its southern neighbor (Figure 3). China and Italy recorded increased imports of U.S. furniture, but this reflected processing steps as well as final retail markets. Figures 4 and 5 graphically display the decline in both firms and workers from 2001 to 2007 in the North Carolina furniture industry. A major profit center remained the annual High Point market (HPU 2007). Although a large competitor, the Las Vegas furniture market opened in 2005, but it has had little impact on the size of the attendance at the historic High Point market or inspired a shift in the geography of furniture manufacturing. Analysis of companies and employment categories in non-upholstered, upholstered, and institutional furniture found that as of 2007 North Carolina predominated in each category (Figure 6). Another furniture cluster 50 miles north of Greensboro's centered around Danville, Virginia, where in mid-2008 IKEA opened the first of four facilities re-occupying the location for furniture manufacturers (IKEA 2008). Traditional firms remain but increasingly rely on imported components.



	Canada	Japan	UK	Saudi Arabia	Australia	China	Russia	Kuwait	Italy	Korea (S)
Yr 2005	31.5	9.1	7	5.8	4.4	2.3	2.1	3.2	1.5	3.4
Yr 2006	34.4	8.3	5.4	4.8	3.6	3.1	2.9	2.9	1.1	2.9
Yr 2007	39	7.3	4.4	4.2	3.8	3.3	2.7	2.2	2.1	1.9

Figure 3. Major U.S. Furniture Export Destinations, 2005–2007.

Logistics Price Pushes and the Furniture Chain

Surging price increases of fossil fuels early in the year 2008 rebalanced the importance of various factors in the global logistics supply chain of goods subject to high shipping costs (Supply Chain Digest 2008). Proximity returned to center stage as businesses predicted major upcoming location reallocations (Table 3). The question of what particular stage in the production process of a specific good should occur at any given location reflects a variety of considerations. China's rise as a global factory came when it reached a development stage distinguished by quality comparable to other locations, availability of a large supplier base, attractive government fiscal incentives, and significant wage differentials offsetting the "friction of distance." By 2008, labor cost generalized as a percentage of total cost in China was 1.0 to 1.5 percent, compared to 15 to 20 percent of total product cost in Europe and 18 to 20 percent in the U.S. (Webb 2008). However, from 2002 to 2008 the U.S. dollar decreased in value by 30 percent against the Chinese yuan, and wages in China continued to increase by 10 to 15 percent annually (Engardio et al. 2008).

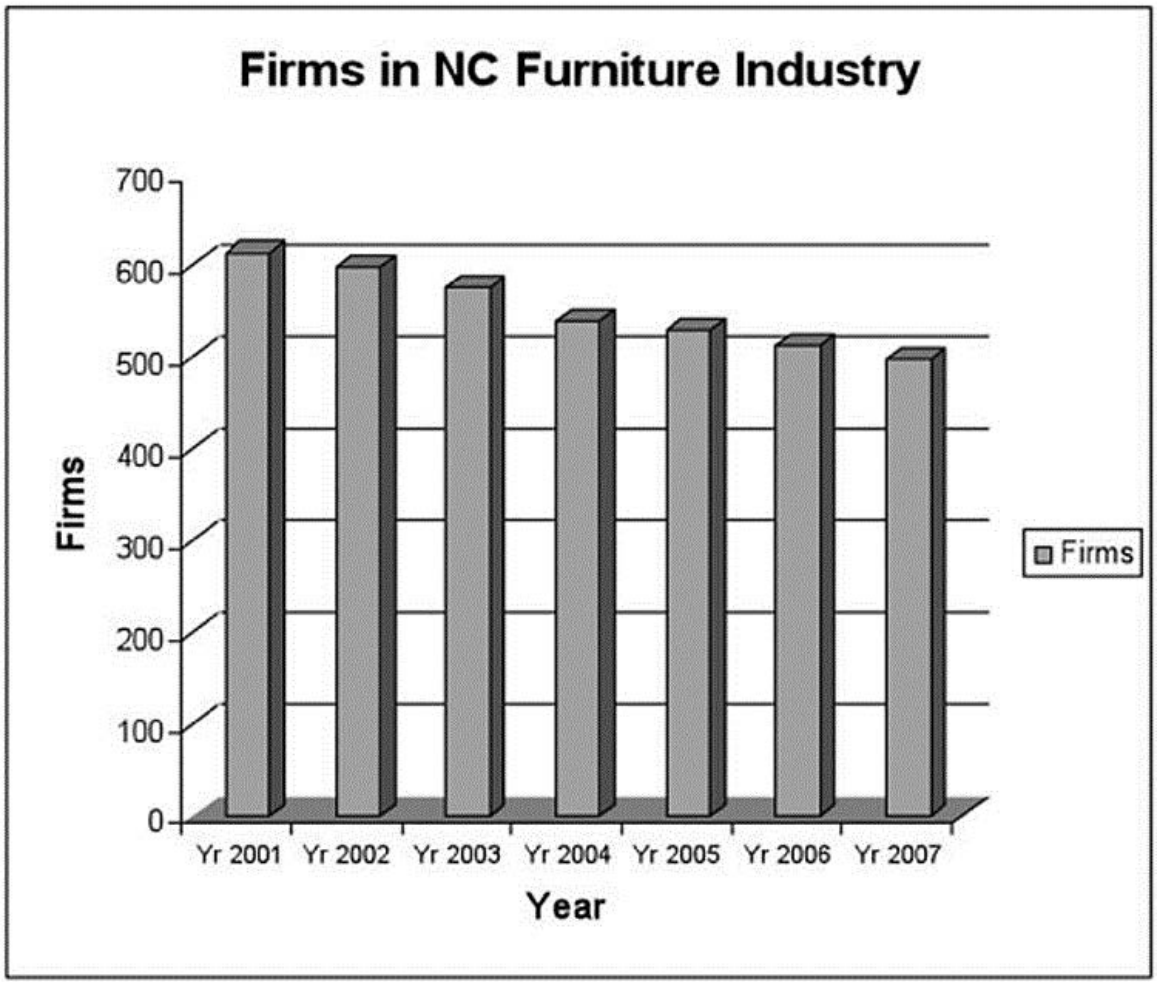


Figure 4. Firms in North Carolina Furniture Industry (NAIC 337120). Source: Bureau of Labor Statistics, US Department of Labor.

The biggest change narrowing the location cost gap came in the form of shipping rates related to the price of petroleum. According to a widely cited report by the Canadian firm CIBC World Markets (Rubin 2008), since the year 2000 the cost of sending a container of goods from Shanghai

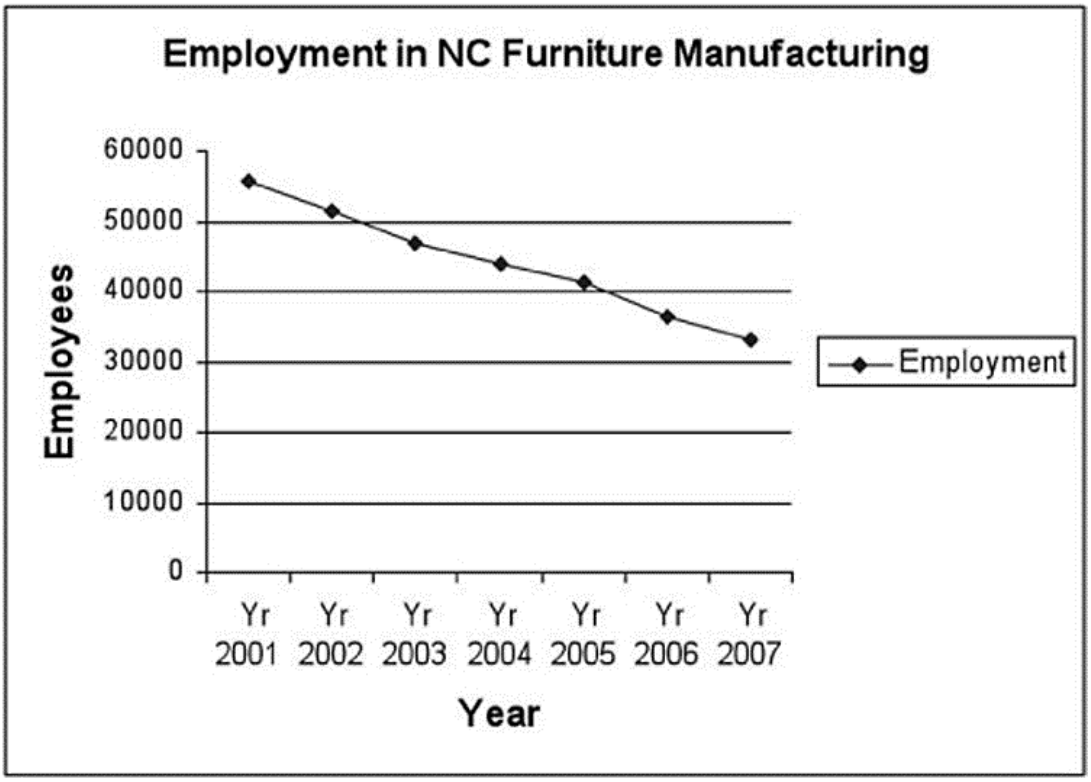


Figure 5. Employment in North Carolina Furniture Manufacturing (NAIC 337120). Source: Bureau of Labor Statistics, US Department of Labor.

Table 3. Plans for Supply Chain Location Shifts in 2009, May 2008

Country	Manufacture%			Source%		
	Increase	Decrease	Same	Increase	Decrease	Same
US	21	20	58	23	25	52
Near shore	21	5	73	30	7	63
China	28	8	64	32	9	59
Other Asia	18	4	78	24	3	73

Source: www.industryweek.com, 8/08, p.38, Logistics Management and Accenture survey

to San Diego rose 150 percent; if oil rose to $200 per barrel, the cost increase would represent $10,000 per container. In the year 2000 the backhaul rate for the relatively empty containers on the U.S.-Asia leg of the Pacific crossing came to $600 to $800 per container. By mid-2008 the backhaul rate stood at $2,000 to $3,000. The cost to bring finished goods to the U.S. from China in 2000 was $2,000 to $3,000 per container; at the height of the fuel spike the rate was $6,000 to $8,000 per container (Russell 2008a; Crump, personal communication 2008). As calculated by CIBC's Rubin, "The freight cost of importing goods into America represented an effective tariff of 3 percent when oil price was $US20 per barrel in 2000; it is now more than 9 percent and will rise to 11 percent if oil hits $US150 [per barrel]" (Rubin and Tal 2008). To be profitable, freight costs should represent 6 percent to 7 percent of the retail price; transportation costs now consume 14 to 15 percent, with a 10 percent increase in trip distance representing a 4.5 percent rise in transport cost. The advantages of speed and containerization space efficiency increases in the recent past are now offset by higher fuel inefficiencies and their resultant cost.

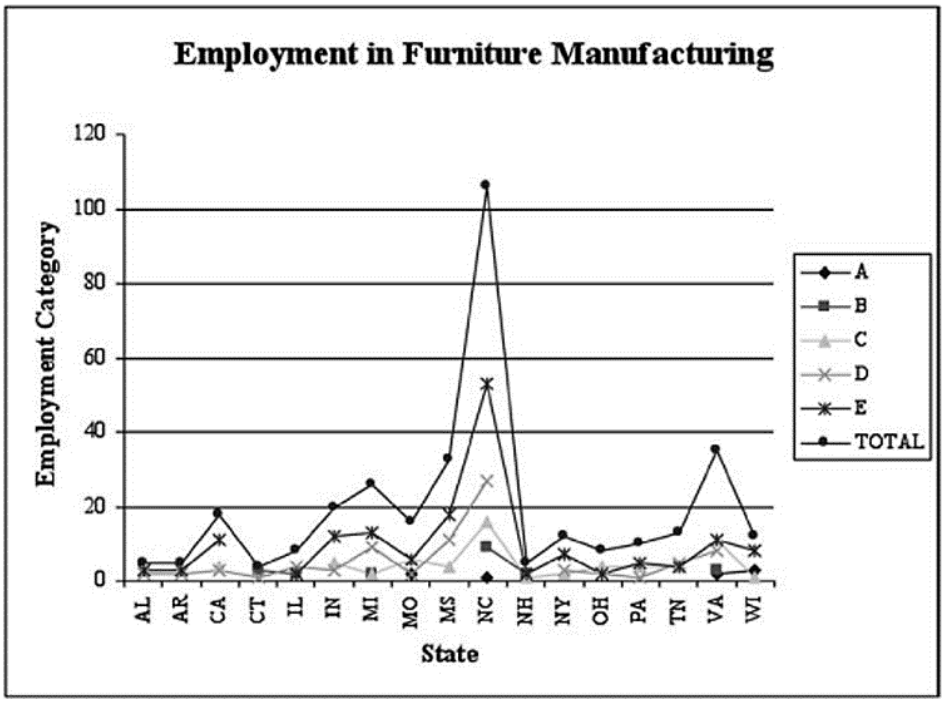


Figure 6. Employment Totals for Top Categories in U.S. Furniture Manufacturing of Non-Upholstered (38.6%), Upholstered (34.5%), and Institutional (15.2%) Categories. Source: Reference U.S.A., 2007. Employment Category: A = 10,000+; B = 5,000–9,999; C = 1,000–4,999; D = 500–999; E = 250–499

An anticipated increasing demand in the developing world for components involved in manufacturing led to price increases in related areas, with diesel fuel demand the biggest factor for future price pressure. Steel's soaring market, largely spurred by construction in rapidly developing countries such as China, doubled the price for a ton of rolled steel from $600 to $1,200. This in turn trebled the price of all metal parts in the furniture industry, reflecting the

dollar-yuan currency differentials (Russell 2008b). Tax rebates (drawbacks) on exports fell from 15 percent to 9 percent by mid-2008, while the VAT remained at 17 percent. The new labor law was estimated to increase manufacturing cost 20 to 40 percent by setting a minimum $200/month wage, while the 21 percent rise of the Chinese currency in 2007 generally depressed profits by 7 to 8 percent (SZFA 2007). For the first time in a decade, shipment of Chinese-made, freight-sensitive goods declined, from 52 percent of the U.S. total exports in 2004 to 42 percent of total exports in 2007 (Aeppel 2008).

Small orders for high-value goods prioritizing short processing time yields the most profit for Chinese logistics firms in a squeezed market—the opposite of furniture shipments (China Daily 2008). In the first six months of 2008 alone, the cost of shipping a container of goods from the U.S. to China rose by 15 percent (Aeppel 2008). A value-added tax (VAT) rate of 19 percent set for all raw goods brought into China was initially reduced by a 15 percent recapture rate leaving only a 4 percent VAT. The recapture privilege expired, leaving a VAT of 15 percent (Katz 2008). Fuel costs bedevil domestic distribution costs as well. Trucks typically obtain only six miles per gallon, which at current rates amount to a cost of almost $1/mile; five years ago the same cost came to 30 to 40 cents per mile. The cost of shipping a truckload of furniture from a mid-price company raised the difference of a wholesale value of $20,000 to a retail cost of $50,000 (industry expert 8/6/08).

A typical production chain for the furniture industry is as follows, using wooden furniture (also known as "case goods") for an example (Kaplinski et al. 2003;Jin et al. 2008, personal communications 8/25/08). First, wood is obtained from sites such as the Appalachian U.S., Malaysia, Thailand, Myanmar, Indonesia, and Russia (for the Chinese furniture giant Markor). Lumber is then shipped to a processing site in China, principally the Pearl River Delta area or Zhejiang Province south of Shanghai, where it is cut, shaped, and finished. Components are shipped out of a Chinese port, principally Hong Kong, and upon arrival (principally at the port of LA/Long Beach in southern California) containers are loaded on railcars and sent to assembly sites in one of the U.S. clusters locations. Trucks transport supplies to the final assembly location and deliver finished pieces to warehouses and/or directly to retail locations. East coast ports take delivery of furniture containers that arrive via the newly deepened Suez Canal. Orders can be routed in a day to markets in Ohio, or two days to Chicago.

Cost and location considerations in the process include 1) the origin of wood, affecting distance to China, 2) the cost of metal for structural parts and source, 3) the cost of labor vs. cost of shipping (less expensive at high-freight prices to send parts to U.S. from China rather than complete pieces). Other important location factors include the percentage of upholstery in the product (cut and sew kit or rolled goods from China, largely assembled in U.S.) and degree of customization (more activity in U.S. if higher priced customized input), the exchange rate of the U.S. dollar, labor availability and wage pressure in China. And always, the distance covered between steps is related to fuel cost.

Variations in the logistics model used also affect the path and stage of furniture components. The wage differential drove the initial rapid exit of furniture manufacturing from the U.S. to China, but other considerations soon became important, delaying a wholesale exodus. The 45-day length of the new supply chain the time it takes a shipment to travel by water from Asia to the U.S., meant that a larger inventory had to be kept on hand to cover orders and the variety of places sourcing various components, with an 18-20 week inventory back-up desirable (Combs 2009). The enormous surge in fuel costs (Figure 7) spurred a new sophistication in U.S. importers seeking a more cost- and time-effective logistics model. The arrangement of shipping containers directly to retail stores that purchase a whole container of goods eliminates the intermediate distribution center router by relying on a wholesale importer, e.g., one operating out of China, to place the same end-destination goods in one container (Smith 2005). International global "third party logistics" (3PL) companies assemble a mixed container of different types of furniture. Upon arrival the shipment is delivered to a regional cross-dock site by truck, then out to local retailers via specialized furniture carriers.

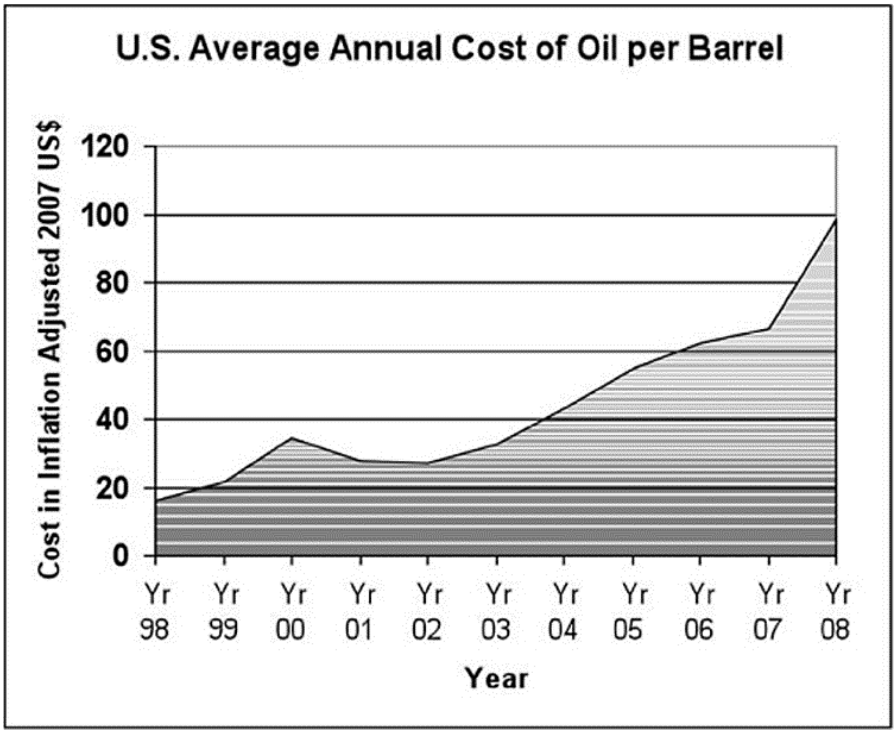


Figure 7. Average Annual Cost of Oil Per Barrel to U.S., 1998–08. Source: IBIS.

High Point, North Carolina, remains one of less than ten prominent national nodes maintained by haulers in response to the concern of being "dis-intermediated," or rendered unnecessary by direct dock-to-door delivery. The area's location on major highways within a half day of all major East Coast markets ensures its continued desirability for shippers. A typical regional hub distribution network across the U.S. begins with delivery of containers from Asia (primarily China) at the port of Long Beach. At a California distribution center containers are directed to

the first-tier distribution sites. The Pico Rivera site, for example, serves the West Coast, Nevada, Utah and Arizona.

Three major regions are redistributed from High Point: a southern route serving the Carolinas, Georgia and Florida; an East Coast route out of a New Jersey facility that covers the rest of the East Coast up through Maine; and a facility in Texas that serves the Southwest. High Point distributes directly to the rest of the country, with some 3PL carriers offering one-day service to the West Coast. Regional furniture trucking firms concentrate on their local area, such as Los Angeles-based companies that handle primarily the West Coast, perhaps adding the Midwest, while Las Vegas serves a tri-state western region. The configuration of the multimodal shipping industry varies by major shipper, resembling in several aspects the development of nodal hubs in the air transportation industry affiliated with certain airline companies. Logistics follows its own logic of historical centers, not yet adjusting to transportation cost minimization.

Future "Spatial Fix" Regions

The Chinese Furniture Industry

Specialized Chinese "supply-chain cities" focus on furniture production in a planned furniture industry cluster of companies that manufacture in the same place but make separate items such as solid wood and upholstery for production-chain consolidation (Fan and Scott 2003). China's major furniture cluster lies in the Pearl River Delta (PRD) factories upstream from Hong Kong in cities such as Shenzhen, Guangzhou and Dongguan that produce 70 percent of China's furniture output. Access to transportation (ports and/or highways) and local government support fosters local concentrations. The eight major furniture clusters largely range along the east coast from Liaoning Province in the northeast through Tianjin and Shandong to the Yangtze and Pearl River Delta clusters. Inner China locations such as Wuhan and Chengdu are being developed as production and distribution sites to raise development and domestic consumption in those less-prosperous regions. Chinese policy promoting advancement of industries upward on the value-added chain seeks to combine abundant, inexpensive and compliant labor with advanced production technology in a "tech-labor intensive" manufacturing blend nurtured by training institutes, innovation forums, and a testing center—all designed primarily for the domestic market (Cao and Hansen 2006; Gereffi et al. 2006; SZFA 2007). American furniture companies that shifted production to China maintained the competitiveness of their products and met the demands of the Chinese government by upgrading processes and developing local links for sourcing the production chain (Tewari 2005). However, the creation of this overseas cluster indicates that this segment of furniture production is replicable in other low-cost locations such as Southeast Asia and South America, given similar low wage and institutional inducements.

The government's desire to decrease the growing rural-urban income imbalance accentuates the shift to Chinese furniture production for a domestic market, particularly in the face of the global financial downturn. Despite attempts to scale up innovation in process and

production techniques, reliance on foreign cooperative ventures to infuse advice led to only incremental quality advances (Cao and Hansen 2006). Design ideas frequently come from overseas, as do AutoCAD plans and foreign experts who fly in periodically to check the quality of subcontractor's implementation (Wilson 2008).

Shanghai's furniture cluster concentrates in the satellite city of Fengxian and its neighboring village of Nantong where generations of residents have aspired to be carpenters and carvers. Factory conditions and furniture quality are indicative of differences from American products. Lighting largely comes from windows and open doors. Simple tools lie on carving tables covered with wood chips. Piles on the floor are shoveled into dustbins, wheeled away for disposal, while American factories are chip-free due to gravity perforated tables that suck down debris, safeguarding workers' lungs. The popularity of IKEA, the Swedish manufacturer of pressed particle-board manufactured simple furniture with no Asian factories, draws buyers from surrounding provinces looking to fill small spaces in apartments. Domestic competitor "Red Apple" is also popular with its pine furniture including children's designs similar to the styles of IKEA. The Chinese company Markor, headquartered in northwestern Urumqi close to the Russian border, serves as the sole licensed distributor for New England-headquartered Ethan Allen furniture. Shanghai is one of its three sales sites in China, part of the third of Ethan Allen stores overseas that also receive brand name lines made in Southeast Asia.

Other Options

China's decision to prioritize investment and promotion of high-value-added, technology-rich industries over low-labor cost sectors, and a law severely limiting the ability of companies doing business in China to dismiss workers, drove companies to seek sites elsewhere. Vietnam attracts furniture makers, particularly around Ho Chi Minh City. From 1998 to 2007 wood furniture imports to the U.S. from China increased 519 percent ($4 billion) while Vietnam registered a 1,054 percent jump ($1.054 billion) (AHFA 2008). The relatively small population size of Southeast Asian countries along with inadequate infrastructure such as lack of sufficiently deepwater ports, distance from major North American markets, continued need to source hardware and machinery from China, and difficulty with promoting learning within or between existing clusters combines to limit their usefulness as an emerging option (Beerepoot 2008).

This in turn spurs speculation on future "spatial fix" locations in Central and South America. A trend promoting the argument for "hemispherization" can be seen in the rise in freight-intensive goods such as furniture to the U.S. from Mexico since 2001, at a higher rate and total than non-freight intensive goods (Rubin and Lal 2008). Several interviewees expressed a belief that Brazil would be the next place for the bulk of middle-level furniture manufacturing after Vietnam, Indonesia and Malaysia go through China's cycle, given its abundance of wood, the movement of European manufacturers to that country, and its shorter distance from the U.S. Artisanal carving work occurs in Peru, Ecuador, Guatemala and the Philippines, but these areas have experienced plant closing. Some of these manufacturers, who are back in the U.S., relying on abundant low-

cost labor pools in the Los Angeles area, declared a willingness to trade smaller profits for greater control of shipping, quality and worker reliability.

According to a forecast of the world furniture industry for 2008-09 produced by a European research institute, emerging furniture-component countries include Brazil, Turkey, Russia and Poland (CSIL 2008). These locations feature abundant low-cost lumber and labor, with governments eager to promote exports. An example of the globalization of the furniture industry comes from a Dutch-managed plant in China that produced furniture on machinery from Germany and Denmark using wood from Romania. Expansion in Indonesia, dwarfing U.S. reinvestments by the largest American furniture conglomerate, indicates that the cost, if distance does not yet tip the scales enough, may lead to a full-fledged resuscitation of former U.S. production sites.

Can the "Furniture Foothills" rise again?

Decades of manufacturing moving overseas left their mark on the former furniture labor pool in the United States. Domestic supplier networks were greatly decreased by companies either going out of business or going abroad to serve their relocated manufacturing affiliation. The finishing step poses a problem to U.S. companies since it would require new environmental permitting and regulations are more stringent now. But construction process changes and lingering advantages of place location combine to hold some hope for a lingering furniture industry presence in its traditional Piedmont foothills. Upholstery remains more suited as an American step in the furniture process due to its sensitivity to design customization of fabric and finishing, particularly in the higher end market (Russell 2008a, 2008b). Needing only 5–6 weeks time lag rather than China's 3–4 months turnaround time, upholstery also fits the rule that customization best here, mass manufacturing there. Although 90 percent of "rolled goods" come from Asia, the "cut-and-sewn" ready to apply product for upholstery avoids tariff restriction due to its classification as a component part (Epperson 2006). Although only 20 sofas fill a container, 200 parts can be accommodated, encouraging adoption of the "postponement" import model. This involves sending "white wood" (unfinished) furniture to regional hubs closer to customers and adding custom features such as upholstery as orders arrive.

In May 2008 Swedish home products giant IKEA opened its first furniture factory in the U.S. in Danville, Virginia (some 50 miles north of the Piedmont Triad cluster in North Carolina), hiring over 200 workers for the Swedwood plant. The reasons given included reduction in sourcing costs, lead time, currency exposure, transportation concerns, and securing supplies for its growing U.S. market (Koenig 2008). IKEA's American model draws on a global corporate network that internalizes product design, production and retail in affiliated facilities. Currently in 11 countries, principally in Eastern as well as Western Europe, IKEA found that its 46 North American companies generated enough demand to merit opening a manufacturing facility on this continent. Danville's former position as a furniture manufacturing site meant a large pool of trained, available labor remained with a political environment eager to attract a furniture

employer, infrastructure, humid climate beneficial to wood, and a good partnership with a local community college for training workers were all in place (Roth, personal communications 9/3/08). A Polish mattress and upholstery company supplying IKEA in other locations joined them, beginning another cluster in a former U.S. site for the same industry. Machinery and production techniques replicate facilities in Poland. Swedwood pledged to create over 700 jobs, out of a global workforce of 13,000; a co-located cabinetry company accounts for another 540 jobs. The 900-acre Cane Creek Centre functions as a cooperative development between the city of Danville (where workers largely reside) and Pittsylvania County (where the industrial park is located), fronting a highway across from the local airport. An incentive package from various government sources provided over $12 million for location inducements. Swedwood typifies the low wood content, highly mechanized process end of the market.

At the July 2008 Las Vegas furniture market, manufacturing giant Kincaid, creator of popular upholstery products under the La-Z-Boy label, announced that its four new designs will be "Made in the USA." Industry leader Thomasville plans to follow the closing of one High Point plant with hiring 100-200 more employees for their case goods facility in Lenoir, North Carolina, for a new chair line. First to fold in the flight overseas, case-goods factories find high unemployment remaining in their heartland. Government programs retrained some with specialized skills to transfer into related employment niches, while others remain on lengthy unemployment compensation rather than respond to job opportunities newly re-opening in an industry they see as short-term such as upholstery. Craftsman Furniture, purchased by a Chinese company in 2006, froze its shift of work to China, cutting the 40 percent transfer in half. Other giants such as Kimball rely on their own global network in a "blended strategy" of mixed foreign and domestic production (IBIS 2008) and will likely increase regionalized dependence. Indications of new life in this traditionally important Carolina industry include reports of more wood consumption—and the added inducement of fewer competitors following a fierce Darwinian reduction (Rohter 2008).

A fuller picture of global production sites reveals a complex picture of reinvestment for a variety of familiar reasons. Thomasville is currently quadrupling the size of their facility in Indonesia, hiring an additional 3,000 employees. Expansion in North Carolina incrementally takes advantage of excess capacity, particularly in relation to final assembly of goods in the U.S. in proximity to upholstery facilities in Hickory and Statesville, North Carolina. The Indonesia expansion dwarfing the American move represents a shift of business from third party contract manufacturers elsewhere in Asia to expand in a traditional carving center on Java. Equipment will be consolidated in this site as well, taking advantage of an existing pool combining low-wage and specialized woodworking skills. Ironically, textile production—also a former North Carolina strength—is also expanding at the same site. A large proportion of ethnic Chinese, a demographic often targeted for domestic disturbances, manage business in Semarang.

Four companies represent a quarter of U.S. furniture industry revenues, with slightly more than a quarter located in the southeast, with 38 percent in North Carolina and 21 percent in Mississippi

(IBIS 2008). Within the U.S., the projected rise in industry employment and product volume holds some hope for additional upturns based on sustained high levels of logistics expense (Table 4). High-end furniture businesses such as Keeler Brass, Grand Rapids' maker of decorative hardware, brought their facilities back from China after being burnt by low-quality copies and subcontractors. Expensive pieces are seen as survivable back in their U.S. place of origin.

Table 4. U.S. Household Furniture Manufacturing, 2004–2008

Industry Factors	2004	2005	2006	2007	2008	2009*
Employment	225,737	215,180	198,605	200,181	201,264	203,193
Growth %	−2.0	−4.7	−7.7	0.8	0.5	1.0
Product volume (1,000,000)	NA	151	138	137	129	130

*projected as of December 2008

Source: IBIS 2008

Another bright spot for the potential future of U.S. furniture manufacturing comes from the example of Hickory Chair in Hickory, North Carolina. One of three companies annually adopted by Toyota from a range of industrial sectors, Hickory attributes its competitive edge to a highly efficient manufacturing process and total team concept it terms "EDGE" (Porto and Smith 2006). Adapting Toyota Way's lean manufacturing, it encourages employee participation in order to shorten production time, reduce waste, raise quality, and speed shipments (Liker 2004). The ability to add 30 employees annually and maintain a profit margin indicates its success with high end furniture. Despite steep decline in furniture demand by late 2008, Hickory Chair marked in increase of 8 percent in demand, with a decline of 10 percent for its closest competitor in the Furniture Brands International conglomerate. Post-Fordist customization in carefully calibrated batch production greatly improves furniture company competitiveness, whereas large firms relying on low-cost labor are most susceptible to global production outsourcing (Drayse 2008; Dugan 2009).

Hickory Chair recently completed another step in its re-envisioned competitive process by hosting a "lean supplier" workshop for selected Carolina furniture manufacturers, similar to a Japanese-pioneered ACCELERATE program tried in Wisconsin. The demise of old ways of manufacturing opened paths to new process innovations. A furniture business group studies and recommends collaboration, in conjunction with a university industrial extension service with a history of Japanese industry connections. One re-invention taking advantage of the demise of furniture manufacturing to reposition for a prioritization of logistics and distribution is reflected in the success of a High Point packaging service supplying packaging material for imported furniture in a former furniture warehouse (Evans 2008). Additionally, kitchen cabinet makers in the northeastern U.S. are reportedly considering relocation to the Furniture Foothills. Following a pessimistic E.U. assessment of furniture futures in that region, Northern European firms are

considering shifting to this region as they anticipate utilizing lower-cost labor, more technology, and production process improvements.

Bust and Reformation

Global effects of the economic recession that began in the fall of 2008 continue to reverberate in the furniture industry. On the logistics side, the price of fuel dropped and then resumed its upward creep. A weighted average fuel price per ton moving from $266.93 in January 2009 to a late July 2009 price of $417.65 led to calls for a "Transpacific Stabilization Agreement." Transportation costs dropped sharply, from ocean shipping to truck charges, responding to overcapacity in the face of sharply decreased demand (www.globeexpress.com 2009). Ports along the East Coast continued to pursue expensive deepening projects in preparation for the huge 8,000 TEU Panamax cargo ships that will ply the new Panama Canal beginning in 2014. Short sea shipping "marine highways" envisioned in the 2010 Maritime Authorization Act will provide more competition for trucks and decrease furniture import costs. As part of its response to the global economic downturn, China poured 75 percent of its massive stimulus package into developing infrastructure to improve its transportation capacity. New competitive factors regarding other Asian locations could include decreased shipping time to offset increased wages.

While the time differential between shipments from Asia at 12 weeks contrast unfavorably with the standard four week lag time from order placement to delivery of U.S.-made furniture, the drop in shipping costs along with wage rate differences still makes it up to five times less expensive to manufacture furniture overseas—including the cost of shipping components more than once across the Pacific to take advantage of skill and wage combination at different stages of the production process.

The economic downturn focused new attention on supply and logistics costs, which previously could be subsumed under higher profit margins. Distant locations stepped up incentives to remain competitive. The Chinese government, for example, rolled back tariff costs, reinstated incentives to manufacture in their western region, and attempted to recapture some jobs scheduled to leave for Vietnam and other lower-cost parts of Asia. A study published in the lead industry journal *Furniture Today* noted that from June 2008 to June 2009 the greatest increase by percent of furniture imports to the United States came from Poland (66 percent) and Vietnam (19 percent); the largest drops came from Brazil (–32 percent) and Thailand (–22 percent), with China in the middle range (–6 percent) (Russell 2009). Mexico (–9 percent) is newly competitive in logistics costs with Asia, taking advantage of the shortened supply chain to capture cut-and-sew upholstery work from China (Combs 2009). Calculations of location efficiencies, in short, have become more complex and tend to vary more rapidly during the current period of economic uncertainty.

Conclusion

This study assessed the impact of cost and time considerations of the global logistic supply chain on the location of furniture manufacturing to examine whether a new "spatial fix" was underway, reprioritizing distance over labor costs and consequently shifting production locations closer to major consumption sites. It was hypothesized that a combination of political policies and local socioeconomic cultural considerations drive individual corporate decisions prompting production location changes. Industry executives and economic development officials familiar with the furniture cluster all pointed to the increase in the cost of transportation as triggering reassessment of manufacturing in this industry.

Table 5. Furniture Manufacturing and Location Advantages

Market	Locations	Advantages	Brand
Low-end	Global, incl. US, China, Vietnam, E. Europe; local market	High mechanization; close to market; low transport cost; high process, quality control	IKEA, MINSK
Medium	Less developed: Indonesia, Viet Nam, Latin America	Low cost labor, artisanal skills, cost stability	Many
High-end	US	Process; customization; reliability	Hickory Chair, designer brands

A recent study based in the EU describes four different scenarios to which geographic locations can be attached: 1) local mass production (overseas low end), 2) global mass production (IKEA-esque, on the NC/VA periphery), 3) local customization (Hickory Chair), and 4) global customization (BRIC emerging nations) (Poliakov et al. 2009). Three different levels of furniture deploy three different competitive strategies, two of which result in traditional U.S. locations while the middle level chases low-cost labor offshore (Table 5). Rather than a full U-turn, a "half-back" repositioning from China to Indonesia occupies the largest mid-range price level. A likely near-term scenario for the U.S. market lies in a continued vertical process of wood shipped overseas (55 percent of cost) to be cut into components, then pieces sent back for assembly and distribution in the U.S. As Asian labor costs less then $1/10^{th}$ the wage rate in North Carolina, focus on the highest level of the global value chain makes sense for domestic producers (CGGC 2008). Institutional furniture remains in demand due to the delivery speed desired by purchasers such as hotels, offices and hospitals. One study predicted triple the rate of average annualized increase from 2008 to 2013 over household furniture (IBIS 2008). The competitive edge of the U.S. in creative design provides an advantage for customized work and confidence in long-established brand names. Whether the heights reached by fuel costs cause a reprioritization of the distance factor sufficient to trigger a return to traditional manufacturing sites in the U.S. remains to be seen.

The preceding detailed summary of location advantages addresses the theoretical question raised earlier concerning the applicability of Western/developed world models to the economic geography of developing regions (Yeung and Lin 2003). The furniture industry example seems to reflect the convergence of familiar patterns for the low-cost segments, accompanied in some cases by an upskilling in place that subsequently drives this segment elsewhere while a newly created domestic middle class market consumes both better quality domestically produced and imported brands. In this case Asia provides less an example of "theorizing back" new developments there to apply to cases in the West, as it does an illustration of an ongoing fracturing and extension of production sites following the type of location advantage most applicable to that market niche (Table 2). The ability of various places at different scales (urban, metropolitan, national, sub-national and multinational regions) to construct supportive institutional networks also varies widely (Coe, et al. 2004). Variations in part reflect, as argued in this study, the affect of individual agents to adopt sustaining innovations.

Logistics-induced manufacturing location shifts indicate the enduring power of proximity and the factor of distance. The call of some business mavens to "think hemispherically" (Bentz 2008), proclamations of a "new regionalization" and predictions of a "near-shoring" shift from Asia to the Americas (Katz 2008) underline the importance of geography's examination of the complete production process. However, a broader combination of cost factors must be weighed to fully assess an increase in any one factor. The global spatial fix mechanism continues to offer alternative sites in addition to repopulating former regions of domestic furniture manufacturing strength with excess capacity of skilled labor and government incentives. A pattern not unfamiliar from the dust of other industry departures and reconfigurations—automobile, carpet, and steel—seems to be emerging. The last region of the cluster location in the more developed country retains design (usually technologically enhanced), infrastructure, market and skilled-labor components. Companies reconstitute themselves—accompanied in short order by splitting into local/foreign companies and spawning new foreign companies—fueled by dramatically less-expensive labor and lured by attractive government incentives to particular places. Local advantages wane as a new middle class based on low-skill, low-wage labor grows and government seeks to recoup a piece of the prosperity induced by diminishing incentives such as tariff reductions. Endogenous disadvantages arise from cultural, political, and/or institutional limitations.

Process and/or product improvements return regions to advantageous investment sites, with hungry brownfield districts eager for jobs and tax revenues since departed. Inexpensive land on the urban fringe adjacent to multimodal infrastructure access is set aside as an industrial park attraction. Incentive packages including community colleges for labor retraining recapture some parts of the value chain. Related firms join the lighthouse leader to supply quality components. Movement to new countries extends the global network of advantage-seeking in the low- to middle-cost sectors, while new process efficiencies maintain manufacturing in relatively high

labor cost locations such as North Carolina. Featured in the popular press as exemplifying an economic comeback possibility, the global furniture industry merits continued examination.

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